



## ITRF2014P EVALUATION REVIEW:

### ■ ITRS Presentation on ITRF2014P (ZA)

- Periodic signals and PSD have been filtered-out during the development of the new ITRF, before recovering the site positions and velocities. PSD is a mathematical model, using two types of functions. **The parametric function was computed using GPS data and then applied to all other techniques.** Arequipa for SLR doesn't fit perfectly in the Up component. Some examples of PSD application are shown. The WRMS of the fit residuals between SLR and ITRF2014P are 0.7, 0.7, and 0.4 cm in ENU. There is still disagreement between the SLR and VLBI scales. For  $T_Y$  and the scale, the discontinuity in 2010 is negligible and the full time series will be considered. A dedicate IERS technical note will be issued with the comparison with DGFI's and JPL's combinations with the same input from the four techniques. The technique center contributions will be included in the Technical Note. In any case, the ITRF from IGN once finalized, will be the official ITRF2014. The JPL and DGFI combinations should be ready soon, Altamimi will contact them again.

### ■ ASI – AC/CC

- The new ITRF2014P has been evaluated in terms of formal correctness, discontinuities and comparison with the ILRS-A time series. The SINEX file with ITRF2014P and the discontinuity file are formally correct and usable; the Post Seismic Deformation model source code and input file are easy to use and integrated into the processing chain. There are some discontinuities needing further investigation for a set of stations that were presented and discussed.  
The ILRS-A time series has been compared with ITRF2014P: the 3D WRMS of the coordinate residuals is close to 5 mm and similar to the value obtained using SLRF2008. The Helmert parameters time series computed roto-translating ILRS-A to ITRF2014P is very close to the one using ITRF2008(SLRF2008). The discontinuity in 2010 for  $T_Y$  and the scale is a bit smaller.  
The ASI time series using ITRF2014P, analyzing the data from 2009 to 2014 is ready and will be used in the test combination. At the moment being, only ASI, DGFI and ESA submitted the time series obtained with ITRF2014P as a priori, PSD model included.

## ■ JCET – AC/CC

There was no presentation from JCET on ITRF2014P as the PSD model was not completely implemented yet in the processing chain. The linear model of ITRF2014P was successfully used to generate new station time series, awaiting the application of the additional PSD corrections for the few sites that require them in order to proceed with the generation of the 2009-2014 time series for the evaluation process.

The JCET SP3C orbital product chain was re-energized and started submitting weekly products to the PP subdirectory at the DCs. A comparison of one week's product file to those submitted by the other ACs shows agreement comparable to that between the rest of the ACs.

## ■ AC Reports

- BKG: the PSD model is not implemented and it will take time.
- DGFI: processing of LAGEOS arcs with fixed ITRF2014P coordinates. Orbit fit for 40 weeks similar to SLRF2008 but slightly worse with ITRF2014, possibly a problem with the rotation from UEN to XYZ of the PSD model in the southern hemisphere sites.
- ESA: activity on ITRF2014P evaluation and implementation of the PSD model. Data from 1993 to 2015 have been reprocessed with and without the application of the PSD model: 2 stations (7403 and 7405) show worse residuals when using the PSD model. Some improvements adding station weights, handling of data issues based on input SINEX. Need to add some missing stations in the internal database. S/W modification needed for the Mean Pole handling in an automatic way. ESA is increasing its effort in SLR data analysis.
- GRGS: analysis of the impact of the PSD model on the orbits.
- NSGF: test for ITRF2014P. The 2009-2014 time series has been computed, no problem found except for 7810. The problem will be fixed soon and the series re-delivered. The gravity field estimation is now implemented in SATAN. Translations between using ILRS  $R_B$  and all  $R_B$  are shown.

## Orbital Product Finalization and Release (PP):

ASI CC reports on test combinations and comparisons. The S/W for the orbit combination is completed and tested using the available solutions. All the Analysis Centers are now regularly submitting the solutions except GRGS. The SP3C evaluation for LAGEOS and Etalon has been made on the orbits from 20 June to 29 September 2015. The differences in terms of radial, cross and along track of the ACs with respect to the combined orbit show expected values: the mean differences are at millimeter level with a few exceptions, the scatter in the radial component is around 5-6 mm while the scatter in cross and along track is higher, a couple of centimetres.

The routine delivery of the combined orbits is expected in January 2016.

## **Revision of analysis procedures and modeling standards:**

- We need to plan how we will migrate the current operational series to a design like the one used during our ITRF2014 reprocessing effort. The weekly gravity input will be ready by the beginning of next year and distributed by Pavlis (AI). We (JCET) are in the process of developing a mechanism that would provide the ACs with gravitational coefficients for the lowest degrees as a substitute to the series provided by CSR for the reanalysis (since we will need these on an operational basis and CSR makes them available with a ~1-month latency). Once we include the estimation of low degree harmonics in our operational products, this will be a trivial step.  
Pavlis will send the page where the mean pole is published (AI). It is updated yearly (early-on in each year) and has the forecast values for the coming year. The switch will be done together with the use of ITRF2014, probably at the beginning of 2016.
- Develop quick response for improved new station positions needed by QC ACs (AI 14)  
DGFI will deliver these coordinates to the QC centers (computed by some of the ACs within the AWG) within a couple of weeks from the initial submission of data, and refine the coordinates after 2-3 months of accumulated data: The final coordinates will be delivered for the routine product. We requested from the GB to allow keep incoming stations “on probation” (e.g. data in quarantine), until the refined coordinates are established.
- Data Handling file: CL (AI) will review the historic biases and the biases from ECP, comparing them with the Data Handling file entries.

## **Routine estimation of systematic errors for all sites (PP):**

The goal will be the timely delivery of long-term estimates of systematics for all the stations.

A plan will be prepared by NSGF by the end of November 2015 (GA AI), the ACs solutions will be delivered by January 2016. Open points:

- Discuss a priori constraints level for estimated errors
- Adopt an official product format (single s/c estimates, combined, etc.)
- Combination process for such estimates and development of an open data-base accessible by stations, researchers, public, etc.

## **Revisit NT Atm. Loading & Gravity implementation as an internal PP:**

Not discussed because this Pilot Project has now a lower priority (to be done after all other PPs)

## **Estimation of low-degree SH of the gravity field (PP):**

- All the ACs are now ready to support this product.
- CC will prepare their S/W to combine them. We need to decide whether to publish in a separate SINEX file for gravity or put it into the SSC/EOP file (?)
- Decide on the test-period for a PP comparing results to independently developed series (e.g. the CSR series used in our ITRF2014 re-analysis);

- Since this capability will be required for the optimal incorporation of the LARES data into our operational products, this PP needs to be completed before, or in tandem with that of the addition of LARES to our target list;

### **Inclusion of LARES in our operational product development (PP):**

DGFI, GFZ and JCET already analysed LARES data. GRGS made some tests, some weeks analysed. NSGF used LARES only for generating predictions.

G. Appleby will provide the CoM correction in the s/w distributed through ILRS **(GA AI)**

PP will be planned at the next AWG meeting.

### **Other topics, next meeting...**

Next AWG meeting: One day or half a day meeting. The date will be decided depending on the EGU schedule (usually available in February each year).

